

REMARKS

STATUS OF THE CLAIMS

Claims 13-16 are pending in the application.

Claims 13 and 16 are objected for informalities, as indicated. Claims 13 and 16 are amended, taking into consideration the Examiner's comments and withdrawal of the objections to these claims is requested.

Claims 13-16 are rejected under 35 U.S.C. 112, second paragraph, for being indefinite as indicated.

Claims 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 60-205641, in view of JP 3-253933 (pages and line numbers hereinbelow reference the supplied English translations), or alternatively over JP 60-205641 in view of Judd et al. (U.S. Patent No. 5,768,623).

Claims 13 and 15 have been amended.

Claims 14 and 16 have been cancelled without disclaimer or prejudice.

Thus, claims 13 and 15 remain pending for reconsideration, which is respectfully requested.

No new matter has been added.

REJECTIONS

Regarding the 35 USC 112, indefiniteness rejections, claims 13 and 15 are amended taking into consideration the Examiner's comments and withdrawal of the indefiniteness rejections is respectfully requested.

Claims 13-16 are rejected under 35 U.S.C. 103 (a) as being unpatentable over JP 60-205641, in view of JP 3-253933 or Judd et al. (US 5,768,623). Independent claims 13 and 15 are amended to incorporate the patentably distinguishing features of dependent claims 14 and 16, respectively, and to clarify the patentably distinguishing features of the present invention. Dependent claims 13 and 16 are cancelled.

JP 60-205641 discloses an access method for accessing one of a plurality of physical

volumes comprised of plural logical volumes and having two counters for counting the number of requests for each physical disk unit. And by comparing the number of both counters, an access request is issued to a single disk in which the number is minimum. In contrast to the claimed present invention, JP 60-205641 does not disclose a minimum access disk method when the disk unit is abnormal.

JP 3-253933 discloses a duplex disk system for accessing alternatively. As shown in Fig. 3 of JP 3-253933, table 321 stores a pair of physical disk number of each logical volume and running status, such as using, not-using and separating, of each physical disk, and alternative accessing performs to change flag of using and not-using alternatively.

Judd discloses a disk array system that has plural host adapters and a construction definition table storing a use flag 146 of the adapters, and recognizes an abnormal host adapter to select a usable host adapter by referring the table, as shown in Fig. 8.

The Examiner states that JP 60-205641 discloses to select a minimum access waiting number disk, and JP 03-253933 discloses that status flag of disk shows a use, not-using and abnormal, or Judd discloses to select a usable adapter between redundant adapters by referring to a flag, and therefore allegedly a combination of JP-60-205641 with JP 03-253933 or Judd would render obvious the claimed present invention.

However, the claimed present invention, to select a minimum accessing physical disk unit through a device adapter, provides, "a memory storing **a logical volume structure table storing statuses of the logical volumes and indicating said physical disk units of each logical volume**, and **a disk management table storing a the-number of operations requested-to of each physical disk unit and statuses of said connected device adapters, for each physical disk unit**" (e.g., claim 13).

Further, in contrast to the relied upon references, the claimed present invention provides, "control means for **referring to said statuses of the logical volumes in said logical volume structure table for the designated logical volume and judging whether a status of said designated logical volume indicates abnormal, comparing with each other the numbers of operations stored in said disk management table that correspond corresponding to a the plurality of physical disk units which store said designated logical volume with each other when said designated logical volume status is judged normal, selecting thea single minimum**

waiting physical disk unit ~~from the disk units storing the designated logical volume which has a minimum number of operations based on the comparison, on which said designated logical volume is allocated according to the comparison of the numbers of operations in said disk management table, **judging whether or not said device adapter connected to said selected single minimum waiting physical disk is normal** from referring to said ~~status~~ statuses of said connected device adapters in said disk management table, and **outputting a request to said judged normal determined device adapter**~~" (e.g., claim 13).

That is, in the claimed present invention, firstly a status of a logical volume is investigated to judge whether the logical volume is abnormal, next according to the investigated result, a single disk selection procedure is performed, that is, a minimum operation number disk selection using the disk management table, and, then, a normal disk adapter selection connected to the determined single minimum operation number disk is performed using the device adapter status information in the disk management table.

JP 60-205641 discloses a minimum access disk selection, but does not disclose a minimum access disk method when the disk adapter is abnormal. While, JP 3-253933 discloses a table 321 storing a pair of physical disk number of each logical volume and running status, such as using, not-using and separating, of each physical disk, and alternative accessing to change a flag of using and not-using alternatively, JP 03-253933 does not disclose minimum access disk selection. Furthermore, both cited references do not disclose and suggest that the status of a logical volume is investigated to judge whether the logical volume is abnormal, and next according to the investigated result, performing a single disk selection procedure, that is, a minimum operation number disk selection using the disk management table.

Further, Judd does disclose a selection of a normal host adapter, but does not disclose a normal disk adapter selection connected with the determined single disk after the claimed present invention's single disk selection procedure, that is, a minimum operation number disk selection using the disk management table.

That is, the claimed present invention is characterized in that "**a logical volume structure table**" and "**a disk management table**" are provided to perform a real access to a single minimum accessing disk by referring these tables.

Similar arguments as applicable to the claims in the parent application of the present

application traversed the rejections over JP 60-205641 and JP 03-253933 and the parent application has been allowed.

In view of the claim amendments and remarks, withdrawal of the rejection of pending claims and allowance of pending claims is respectfully requested.


CONCLUSION

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

Respectfully submitted,
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